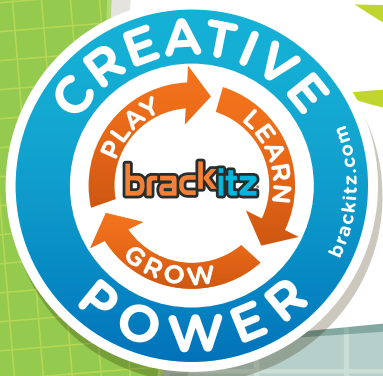


# brackitz®

U1 L1a  
V2.2

LESSONS





# Lesson 1: **HOW BIG** in 2 Dimensions?



Students begin practicing spatial thinking and vocabulary as they're introduced to a small character to compare with known objects, and using Brackitz unit planks to specify two dimensions (2-D): height and width.

## Objectives:



Students explore two dimensions and compare the Gingerbread character to common objects to understand size and dimensions. "I can decide how big something is by describing height and width." "I can compare size by thinking about everyday objects."

## Vocabulary used in this activity:

dimension, measurement, height, width, describe, two dimensions, 2-D

## Standards

### NGSS

#### Science and Engineering Practices

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem

### CCSS-MATH

K.MD.A.2, K.G.B.5, 1.G.A.2, 1.MD.A.2

### CCSS-ELA

SL.K.1.A, SL.K.5, RL.K.1, RL.K.5, RL.K.7, SL.1.1.A, SL.1.5

### ECERS-R

**Language-Reasoning:** Books and pictures. Encouraging children to communicate. Using language to develop reasoning skills

**Activities:** Fine Motor, Art, Math/Numbers

**Program Structure:** Group time

## Time needed: Materials and Supplies:

35-40 minutes

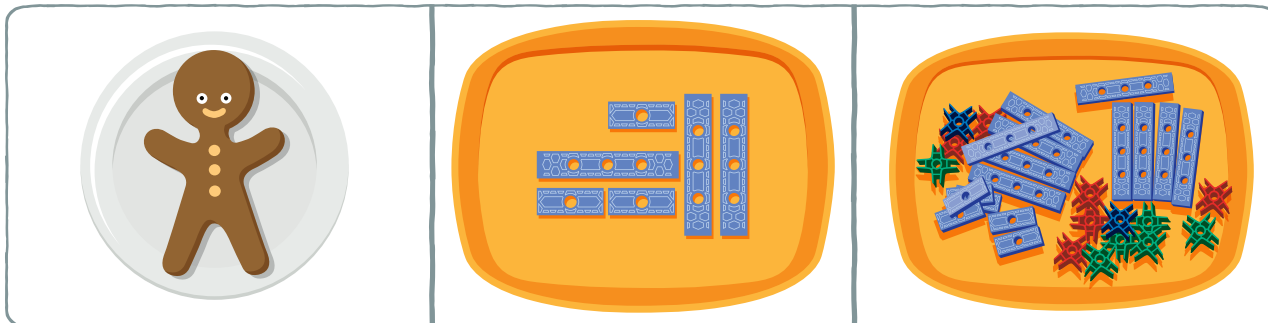
Gingerbread character, paper, pencils/crayons, Brackitz planks and 4-way connectors, gingerbread cookie-sized "people" cut-outs (these should be not much bigger than a child's hand). Optional: Cookie or playdough to make more tactile figures, tracing paper.

## Setup and preparation:

Have trays and characters cutout for each student or group with the same number of planks and connectors for each group; help students cooperatively form groups of two or three.

## Background knowledge:

Prior to this lesson, the only background knowledge students need is to be able to pick things up and grasp them. Optional pre-activity: Read [The Gingerbread Man](#)



# Lesson 1: HOW BIG

## in 2 Dimensions?



35-40 minutes



### Whole Class

10 minutes



Holding the Gingerbread, introduce our character, "I have a new friend here. S/he's small but lives in our big world which presents some special challenges for him/her. S/he is bigger than a bug (most bugs are smaller than the tip of your thumb), but smaller than a bunny (most bunnies are bigger than your two hands could hold). What things can you think of that would be smaller than our friend? What things could be larger than our friend?"

(Have class list items - write or draw list; e.g. smaller than: kitty, teddy bear, book, car, bigger than: ant, pebble, block, peanut.)

### Instructor Notes and Tips

Help students compare the Gingerbread's size with other things they tangibly understand. What helps them most understand and relate to the character's size - pencils, plates, puppies? Help your students:

- Use the Gingerbread character as a reference for height and width (1 plank in height, 1 large plank and 1 small plank connected in width)
- Use common objects to compare
- Contrast by specifically mentioning height and width; e.g. "a new pencil is taller than our character, a crayon is shorter than our friend."

### Group Exploration

5-10 minutes



How big is our friend? Hold it next to a Brackitz plank and see if you can measure its height (how tall) and width (how much across) and describe its size. "Can you check with your Brackitz planks? Is it taller than one plank? Shorter?"

Guide students to lay Brackitz planks along the standard axes of height and width, rather than measuring diagonally.

### Group Challenge

15 minutes



"When we draw on paper, we draw one or two dimensions - usually HOW TALL, HOW WIDE. Each of these (height or width) is one dimension and we can measure it."

Let's build a picture frame that is too small to fit around our friend. Make it too short first. In your groups use these planks and connectors to build a rectangle, but make it too small. What piece would you change to make it fit?

Now remake the frame but make it too narrow - not wide enough. Which dimension do you have to change? To make it fit? Now make it "just right."

This is a chance for students to begin building with Brackitz. Watch to make sure groups are able to share ideas and Brackitz pieces functionally. It can help to do a hands-on demonstration with groups on using the connector pieces. You can try monitoring sharing in the group, or have a timer to help systematize sharing.



# Lesson 1: HOW BIG

## in 2 Dimensions?



### Group Reflection



5 minutes



### Instructor Notes and Tips

(Teacher brings whole class back together and aggregates from small group builds.) "We need to be sure we all know how big our friend is. We built our rectangle pictured frames in two dimensions. Let's trace the rectangle you built as a frame into your worksheet and write down what pieces were used."

Make sure that before you conclude there is some consensus of how BIG the Gingerbread character is in all two dimensions. Record somewhere that you and students can reference for future class building challenges - how TALL? (Hold up plank, and indicate using holes until class agrees. Repeat this question and group answer/consensus building for WIDTH.)

Using planks as a unit of measurement will help students continually refer to these dimensions

### CHALLENGE ADVANCED STUDENTS

**In discussion,** ask students to consider what may happen if we don't understand something's size. Are there issues with making things that are too big or small? What examples can they think of? (One real life example is if they think of mittens or shoes that are too big or small for them.)

**In the group exploration,** have students trace and/or cut out their own paper figures. This is great fine motor practice and making dimensions less abstract.

**In the challenge section,** you can have students note if they made their "frame" much bigger or smaller than the character's dimensions and ask what that frame would fit (a puppy? a peanut?)

### SIMPLIFY FOR YOUNGER GROUPS

**In discussion,** As you introduce size, use several models. Have paired models (cookie or card-board): One pair that is the same height but different widths, one pair that are the same width but different heights. Help students understand this by having them hold them side by side, or trace them on paper, measure with rulers, and Brackitz planks.

**In the group exploration,** have enough paper cutout figures for each student or group to measure without needing to trace or cut them out.

**In the challenge section,** have all student groups use a cardboard or cookie model and build around it, checking that they can move the character in and out of the container without bending it or breaking it.

# Lesson 1: **HOW BIG**

in 2 Dimensions?

Our gingerbread friend:



# Lesson 1: **HOW BIG**

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## Student Worksheet



Trace the frame you built here:





# Lesson 1: **HOW BIG**

in 2 Dimensions?



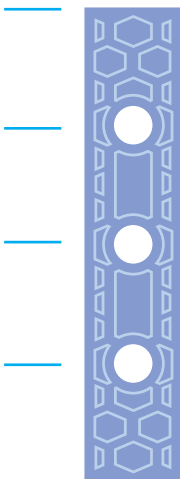
## Student Worksheet



Trace our gingerbread friend here:

How tall is our gingerbread friend? Trace the Brackitz piece that shows how tall gingerbread is.

\_\_\_\_\_



How wide is our creature? Trace the Brackitz piece that shows how wide gingerbread is.

\_\_\_\_\_



# Lesson 1: **HOW BIG**

in 2 Dimensions?



**Contrast:**

**Bigger than -**



**Smaller than -**

